Knoweth Thyself and Thine Audience: How Ideological Reforms Led to the Industrial Revolution and Demonstrated the Changed Relationship Between Suppliers and Consumers

An Honors Thesis (HONR 499)

by

Michaela Cox

Thesis Advisors

Dr. Nathanael Snow
Dr. Steven Horwitz

Ball State University

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Abstract

The Industrial Revolution encompassed great change in the lifestyles of individuals. As the hierarchal layout of society started to lose its influence, the opportunities for lower classes to change their lives and positions in their communities grew. Starting in Western Europe, society became more open to this change in persuasive rhetoric and welcomed new inventions and innovations to technologies. The resulting economic boom was due to inventors using marketing tactics, such as better knowledge of consumers' preferences. Competition, motivated by pursuit of profits, among rival producers, resulted in more products and services that bettered the lives of everyone. This paper portrays the world before, during, and after the Industrial Revolution to examine the causes and effects of this influential time period.

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"My parents, for never giving me a ride to school, the LA city bus driver who took a chance on an unknown kid, and last but not least, the wonderful crew at McDonalds who spend hours making those egg McMuffins, without which, I'd never be tardy." – Travis, *Clueless* (1995 film)

Process Analysis Statement

Starting in December of 2019, I began reading recommended texts from my advisor, Dr. Steve Horwitz, for my thesis, with the impression that I knew what my thesis was going to be. My thesis would be a paper over the Industrial Revolution in the 1700s, and why it happened when and where it did. I soon learned that I knew very little about this topic from an economic standpoint and was even less sure about my project. Although I have always been interested in history, my knowledge of the time period was certainly lacking. Through my reading of many texts written by economic historians, I began to gain a grip on the time period as well as form connections from history and economics to my own major, marketing. That was the most exciting part for me – looking at the past and seeing the roots of modern marketing techniques, used before marketing was even a discipline.

For the first half of spring semester, I spent my time reading, and taking notes, and emailing questions to my advisor, rinse and repeat. In the middle of the semester, however, Professor Horwitz's health required him to step back from helping me. I am very grateful for the start that he gave me. Through correspondence with different professors, Professor Snow volunteered to take over advising my paper, and with his help, I was able to get started writing.

My paper changed from merely being an analysis of the time period before the Industrial Revolution into a project tying together primary and secondary sources to demonstrate the change in the beliefs of individuals and the effects of marketing adaptations. I also dived more into marketing journals to learn about the beginnings of marketing. My main regret with this thesis is that was hard to find research pertaining to marketing during the time period, as many writers addressed the influences of marketing rather lightly.

I am really proud of this paper, and of the efforts that I put into it, even if the project altered with the more I read and learned. It was so much different and larger than anything that I have ever completed, and I feel very accomplished looking at this culmination of a semester's work.

Bob Dylan (1964) sang that "the times are a'changin,'" but the world never experienced a change as dramatic as the Industrial Revolution. Governments, societies, and the roles of individuals were radically altered over a period of a hundred years. This period in time is often viewed in a negative light due to the poor working conditions of laborers, the expansion of pollution, and child labor. Encyclopædia Britannica editor, John Rafferty, states that the development of factories drove many workers to cities, *forcing* them to live in overcrowded, poorly ventilated shantytowns, where outbreaks of infectious diseases were easily spread. Natural resources were also depleted "to fuel factories and sustain the output of each and every type of manufactured good" (Rafferty, 2020). The Industrial Revolution did mark a drastic change in the way people had lived since the dawn of civilization, but it increased the *opportunities* that individuals had to better their lives. Society became accustomed to the idea of self-betterment, and the economy developed to welcome innovations. During the Industrial Revolution, Western ideology turned more individualist, supporting the property rights of individuals while allowing them the dignity of inventing and innovating with the incentives of profit and fame. An individual that knew her target market and catered to her audience's needs impacted the economy with her invention. Innovations of the market allowed for the diffusion of ideas as well as economic gains.

Many theories have been proposed to account for this change. Nobel laurate and economic historian, Douglass C. North (1981) illustrated the social and economic shift in his book *Structure and Change in Economic History*. If an ancient Grecian were "miraculously transported through time to the England of 1750, he or she would have found much that was familiar." In contrast, "the Greek alighting two centuries later [in 1950], would discover what would appear to be an unreal world in which little would be recognizable or even

understandable, so much had the state of mankind been altered in that relatively brief historical time span" (p. 158). North argues that the political institutions that were in place allowed for this change, where before, the existing institutions had proved an obstacle for economic growth.

Before the Industrial Revolution, humans formed states in order to enforce property rights, socially accepted constructs of how resources are used and owned. The states that were established, and have morphed in purpose and function over time, are "organization[s] with a comparative advantage in violence, extending over... geographic area[s] whose boundaries are determined by its power to tax constituents" (North, 1981, p. 21). In addition to enforcing property rights and taxation, states also enforced contracts, standardized measurements, and lowered transactions costs as a result of state actions.

North begins at man's primitive state as hunters and gatherers. The small bands of people, due to their limited population size, did not need governments, but "exploited [their] opportunities in agriculture by constraining members with rules, taboos, and prohibitions, almost as effectively as if private property rights had been established" (p. 81). In small groups, individuals could check and balance each other to ensure that resources were being used fairly and efficiently. In small enough groups, each member would be necessary for the survival of the community, as roles needed to be filled. This gave importance to the individual and could allow for more equal voice when dealing with the division of resources and the making of decisions that would impact the group as a whole.

As these groups learned to farm, there was a shift in property rights. Before, each group shared resources communally. The sedentary act of farming was an investment by the community, that needed to be protected from outsiders, who could steal resources. The resources that agriculture brought forth necessitated that access was open to members of the community

who had invested the resources in the first place. This concept of exclusive property rights is important, as the rising population—that was sustained through the advancing agriculture—meant that new forms of enforcing these rights had to be put in place—and this brought about the introduction of the state. The state took on many forms, "despotic" and "democratic" for example, and often varied in size and scope (p. 86, 92).

Economist Mancur Olson (1993) developed the theory of the "stationary bandit" to explain the transition from communal societies that used informal norms to make group decisions to states where decisions were made by individuals or people of a particular class for the group as a whole. Olson theorized that the bandits, who lived off of the crops and resources of communal farmers instead of producing for themselves, became stationary by staying with one community instead of roving to steal from new groups of farmers. The bandits could "monopolize and rationalize their theft in the form of taxes" by offering protection to the community from other bandits. Maintaining this station required the bandits to "provide a peaceful order and other public goods that increase productivity" (Olson, p. 567). The bandit could depend on the cooperation of the community as long as he placated the people and did not infringe too far upon their resources, as to not cause a revolt. Bandits and the states they created maintained this balance through *legitimization*, which shall be expanded on later in this paper. By protecting the property rights of the farmers from other bandits, the stationary bandit could continue extracting *rents* without the hassle of being threatened by farmers anymore.

The economic definition of rents, which applies to this scenario, is described by Michael Munger as "any return on investment, or effort, that exceeds the rate of return" (Munger, 2006). The arrangement by the stationary bandits is known as *rent seeking*, that economist Robert Tollison argues is "the expenditure of scare [limited] resources to capture an artificially created

transfer" (Munger, 2006). Rents are different from profits, as rents have a limit to what can be extracted. The farmers only had a certain amount of resources that the bandit could take as a wealth transfer. Profits, on the other hand, occur when new wealth is created through the development of opportunities.

The enforcement of property rights by states not only protected resources, but could also serve to encourage further investments, by "reward[ing] the owners… [and providing] a direct incentive to improve efficiency and productivity, or in more fundamental terms, to acquire more knowledge and new techniques" (North, 1981, p. 89). Under exclusive property rights, farmers in the community would be encouraged to invest more time into their crops, knowing that the harvest would better benefit them if they increased their efforts.

This incentive could be negated, however, if property rights were infringed too much by the state. For farmers living under communal property rights, where the elites who did not participate in the labor of farming received a large share of the agricultural gains, there was less incentive for farmers to put extra time and resources into improving their crops because the farmers did not reap the full rewards. The elites coerced the transfer of resources leveraging their comparative advantage in violence, marking a diversion from the voluntary exchange of goods and services between individuals.

States also brought about organizational decision-making – which North states "is an absolute prerequisite for a viable agricultural community" (1981, p. 93). While this included the routine decisions of who would plant what, and when, as populations in communities grew into cities, the roles of the institutions changed as well. States used coercive power to enforce community rules and to compete with other states. Under large governments, resources were taken from the people in order to further the goals of the institutional state. States can act to

encourage investments, innovations, and the use of new technology, but the extraction of taxes can also squelch these incentives, just as the threat of outsiders could in primitive societies.

North observes that before the Industrial Revolution, the actions of states often suppressed economic innovations, through both the "widespread tendency of states to produce inefficient property rights and hence fail to achieve sustained growth; and the inherent instability of all states, which leads to economic change and ultimately economic decline" (North, 1981, p. 23). The "existence of the state is essential for economic growth" (p. 20). However, as the state enforces property rights for individuals and prevents anarchy, economic growth is "inherently destabilizing to a state" (p.29). For a state to maintain coercive power over its people, the state must collect rents through taxes to provide public goods, such as enforcing contracts through law and providing a military to protect constituents from outsiders. Constituents allow for their property rights to be infringed for the benefits that the state bestows. With this authority, however, comes great power to abuse, and the ruling class often acted in its own interest, and not in the interests of the people.

The stations of rulers were threatened by rivals: the upper class in their nation, who had the power and connections needed to dethrone the ruler; authoritative religious institutions; and competing states. These threats created incentives for rulers to protect themselves, often at the expense of their constituents. Political rivals were substitutes to the current ruler, and to keep them at bay, the ruler either bribed these rivals with property rights extorted from constituents and/or the ruler increased their own protection through the expansion of the military. For example, after the Hundred Years' War in France, the state neutralized the threat of "potential political rivals within France (the nobility and the clergy) [by] exlud[ing them] from taxation" (North, 1981, p.149). Either way, North states that "taxes and confiscations alter the structure of

property rights so that there is a reduced incentive [for the constituents] to undertake productive activity" (p.115).

Another threat to rulers came in the form of the people they ruled over, and in order to quell uprisings, states needed to maintain legitimacy, which they achieved through strategic marketing. The mechanism for maintaining legitimacy depended on the society. For ancient Egypt, "religion played a crucial role in legitimizing the coercive power of the ruler… the Egyptian Pharaoh was both the ruler and a god" (North, 1981, p. 95). Decisions made by the Pharaoh carried more weight with the constituents, as the Egyptian people believed the rulings to be of divine nature. The Egyptian state was secured by this legitimizing tactic for many centuries.

For the ancient Greeks, the unity of the city-states was legitimized through "a belief in a common ancestry, a common language and religion" and marketed through the "use of the same oracles, and a common participation in the Greek games" (North, 1981, p. 96). Maintaining religious sites and the facilitation of the Olympics were investments in the legitimacy of the state and methods of subduing and uniting the Greek people.

For Western Europeans, the manorial system of "a lord and his knights [as]… both a warrior class and a highly specialized ruling class" was upheld by the "ideological gloss" of chivalry (North, 1981, p.127). Under chivalry, the duty to the upper class was honored by the serfs, slaves, and free laborers, who outputted goods and services in exchange for protection and justice offered by the lord and his knights.

A more modern example North provides is the investments that nations like America, China, and the Soviet Union made in their educational structures in the 1950's to promote

capitalist or communist ideologies to the young, so that future generations would believe in and uphold the current governmental structures (North, 1981, p.54).

States invest in their own legitimacy in order to maintain the support of the people. States' marketing often leans more towards coercion than it does persuasion, however, and so the marketing that arose by individuals around the time of the Industrial Revolution was radically different from what society had witnessed before and was subversive to the existing institutions and methods states utilized to maintain legitimacy.

A state's motives often did not align with those of its constituents, so economic growth was often slowed to maintain the position of rulers. What differentiated the states of Western Europe from other states allowed the Industrial Revolution, a period of sustained economic growth, to take place. North claims that "the technological change associated with the Industrial Revolution required the *prior* development of a set of property rights, which raised the private rate of return on invention and innovation" (1981, p. 147) (italics included).

The foundations of this change developed from the century-long population decrease of the plague and the increased costs of maintaining a state due to military advancements. With the diminished population, labor became scarce, and "the relative bargaining strength shifted from the lords to the peasants... as a consequence, the master-servant aspect of serfdom gave way to recognition of copyhold rights and an end to servile obligations. . .legally swept away in 1666" (North, 1981, p.134-135). The labor hours of men were no longer dictated and controlled by lords, and that changed the way that humans had lived for hundreds of years.

States were further weakened by the heightened costs of maintaining an army, as knights were no longer guaranteed as they had been under serfdom and chivalry. North states that "the size of a king's army now depended on his purse," that caused a rise in the market for

mercenaries, and troops had to be paid more to guarantee their willingness to fight (1981, p.137). The growing expenses of the state left European rulers in debt that could not be alleviated through further taxation of lords, who were already over-taxing a diminished population. Further taxing could cause powerful lords to revolt, that would only increase military costs and the risk of the ruler losing his or her throne. The costs for states to maintain legitimacy were becoming too high. Instead of increasing taxes at the risk of angering the population, many European states settled on selling property rights back to the constituents in exchange for revenue. North lists many examples of this, including the "taxation of land transfers," the granting of legal rights to merchants, and exemptions from guild restrictions (legalized monopolies), all "in return for revenue" (1981, p.141). These exchanges signaled a shift in ideology consequent of a change in rhetoric, sweet talking.

One of the first nations to achieve economic growth was the Netherlands, a nation under the rule of the financially strapped king of Spain. A country with limited natural resources, the Netherlands had an "initial comparative advantage in the manufacture of cloth [that led] to the development of an international market place where a wide range of goods was traded." The leader of the Netherlands at the time, pressured by the empowered constituents, instated a representative body that could "vote taxes for the ruler" in 1493, and as a result, the "make-up of the assembly favored legislation that fostered the growth of trade and commerce and the granting and protection of private property rights that made growth possible" (North, 1981, p. 153). Due to the dependence on commerce, and the merchants that made the financial gains possible, the laws boosted trade, and the revenues brought in by the low tax on goods made the Netherlands the "crown jewel of the Hapsburg empire." The population of the Netherlands depended on trade

for their livelihoods, and the laws that were enacted benefitted individuals, allowing them to keep their gains from trade and encouraged innovation.

When the King of Spain, who acted as a remote stationary bandit over the Netherlands, exacted more financial demands on the nation, the provinces revolted, and "the republic that emerged retained the structure of law and property rights that had led to the commercial eminence of the Dutch in the first place" (North, 1981, p. 153). Other nations whose states had weak holds over their people, notably England, took notice of the United Provinces successes and followed suit. With the return of property rights, and states that upheld these rights without extorting them, individuals gained the incentives to invent new technologies, as well as innovate existing knowledge to be more efficient and effective.

A reoccurring theme throughout North's narrative is the role of ideology. States rely on the complacency of the people, whether that is through content civilians or scared ones, in order to continue extracting rents. If the civilians are not pleased and the legitimacy of the government is in question, there is always the threat of revolt. People under a common nation, religion, or language are bonded through their shared beliefs and common rhetoric, and a state's enforcement of these traits can strengthen the state's influence over its constituents.

Deirdre McCloskey, an economic historian who specializes in rhetoric and philosophy among numerous other topics, argues that ideology plays a much larger role than just in the legitimization of governments. In *Bourgeois Equality*, McCloskey presents the concept of "sweet talk" as the driving force of the Industrial Revolution, and how sweet talk among common people led to the weakened state influence that North detailed. The population decrease due to the plague and the increase of state debts destabilized states, and this weakening of states enabled the push for the selling of property rights back to the constituents. Over many centuries in

western Europe, rhetoric evolved. Constituents became less dependent on government directives and orders, and instead learned to listen to each other as they bargained in the market. When individuals had the freedom to invent – and to collect gains from inventions that the state did not extract – they had the incentive to cooperate and work with others. They learned persuasion, or "sweet talk." The gains from collaborations birthed the Industrial Revolution. Until this period commerce and power were controlled by rulers and by states, but the Industrial Revolution demonstrated a break from this equilibrium, as individuals of every class began to change their worlds.

McCloskey (2016) asserts that this change can be seen in the Netherlands as early as the 13th century. She quotes Herman Pleji, a student of Dutch literature, who states that "the virtues associated [in the sixteenth century] with capitalism and the Reformation were not new… [but] had already been setting the tone for more than two centuries" in the Dutch regions Brabant and Flanders. Pleji argues that urban literature, such as *Heinric en Margriete van Limborch*, "played an active role in forming, defending, and propagating what came to be called middle-class virtues, which revolved around practicality and utilitarianism" (McCloskey, 2016, p. 330). This work, which was originally written in the 13th century, was republished in 1516, "with such commercial amendments as having [the main knight find]… honor not merely in the knightly fighting and hunting and wooing,… but the honest paying of the merchant(s)" that he encountered (p. 330). These edits were evidence of the subversive beliefs that were growing among the populace.

Chivalry, and the principles that it held to, helped to maintain the legitimacy of states, but as individuals found value in their own achievements, what was due honor evolved to include acts of individuals towards each other (McCloskey, 2016, p. 330). The change in rhetoric

embodied the change in what was considered virtuous in society. Without the strong presence of the state or high aristocracy, Dutch society came to rely and value the economic contributions of the middle-class. McCloskey labels the "owners and managers in town, risk takers or word workers, big or small in their capital, disproportionately literate and numerate, earning a living by conversation and calculation" the *Bourgeois*, without the negative connation derived from Marx (2016, p. xvii). The influence of the bourgeois originated from the persuasion that they employed and from the inventions, innovations, and ideas that they brought to the market.

Persuasion and coercion are very different. *Webster's Dictionary* defines coercion as being "compel[led] by force or threat" (Webster's Dictionary of the American Language, 1976). Not all state actions resulted in force, but the danger of force being unleashed was enough threat for constituents to follow the directives of the elites, whether to pay more in taxes, to labor in the lord's field that day, or to go to war for their king. McCloskey labels this the "Aristocratic Deal," in which:

> You [the constituent] honor me, an aristocrat by natural inequality, and give me the liberty to extract rents from you in the first act, and in the second and all subsequent acts. I forbid you under penalty of death to seek competitive 'protection.' By the third act of the zero-sum drama, if you have behaved yourself, and have pulled your forelock or made your curtsey as I ride by, I will not at least have slaughtered you (McCloskey, 2016, p.22).

Most of humanity had lived under the Aristocratic Deal for thousands of years. Birth dictated one's station and any deviation was peculiar and rare. The stations were preserved through the threat of force. The upper classes were due honor, and this equilibrium legitimized the existence of the state. The protection referred to in the passage was just as much from other states as it was

protection from the aristocracy of the peasant's own state. McCloskey describes this relationship as "extortion, not protection," as civilians acted out of fear of their own government's retaliation (2016, p. 22). In this economy, ownership was temporary at best; for at any moment, elites could take it away. Most occupations were under some version of "coerc[ion] or supervis[ion]" (2016, p.495).

Persuasion is convincing someone else, without the threat of force or the duplicity of fraud. Persuasion is the backbone of the "Bourgeois Deal" in which:

> You accord to me, a bourgeois projector, the liberty and dignity to try out my schemes in voluntary trade, and let me keep the profits, if I get any, in my first act – though I accept, reluctantly, that others will compete with me in the second act. In exchange, in the third act of a new, positive-sum drama, the bourgeois-betterment provided by me (and by those pesky, low-quality, price-spoiling competitors) will make you all rich" (McCloskey, 2016, p. 21).

This Bourgeois Deal was between individuals who were not bound to act in certain ways because of their station in society or by the threat of government force. Instead, individuals could persuade each other with "sweet talk," with the promise of future profits and/or gains – using inducement, not intimidation or lies, to "change minds" (2016, p. 490). The ability of individuals to do this depended on a state that would not suppress the means of negotiation or take away the incentives to trade, as well as other individuals who were willing to cooperate, and to respect the deals that were being made. McCloskey labels this switch in society as the "Bourgeois Reevaluation… [that] liberated and dignified ordinary people making betterments" (2016, p. 506). In societies where "it was not a sin to be bourgeois," such as the Netherlands in the 1600s,

individuals had the freedom to make trades that bettered themselves and their partners and were encouraged to do so (2016, p. 329).

Economic historian, Joel Mokyr, who specializes in the time period of 1750-1914, chronicles technological advancements throughout the history of the world in *The Lever of Riches*. Mokyr stresses that technological advancements were slow to be adopted and improved before the Industrial Revolution in the 1700s. Generations of farmers plowed, sowed, and reaped using the same technology that their parents and grandparents had toiled under. The slow adoption rate of new tools and methods meant that "old techniques often stubbornly survived and coexisted with the new for decades and even centuries" (Mokyr, 1990, p. 32). Individuals were more likely to work with what they knew rather than try to improve their tools or invest in new technologies.

Inventions and innovations were stalled by the stratification of society and the lack of incentives that individuals faced. Inventions and innovations are not interchangeable synonyms, but instead "are complements" (Mokyr, 1990, p. 10). Mokyr argues that:

> Invention depends on factors that determine individual behavior, as the inventor is ultimately alone in his or her attempt to make something work. Innovation, on the other hand, requires interaction with other individuals, depends on institutions and markets, and is thus largely social and economic in nature. (1990, p.11)

Inventions require the creation of new technologies with new knowledge, while innovations apply existing knowledge to make improvements in efficiency, cost, or production.

For societies to be "technologically creative," they must "be both inventive and innovative, as "without invention, innovation would eventually slow down and grind to a halt… [and] without innovation, inventors will lack focus and have little economic incentive to pursue

new ideas" (Mokyr, 1990, p.11). More than this, for new inventions to be used by the market, they would often have to be innovated to fit environmental needs as well as fit with each society's needs. Innovations required the support of the market., which enabled exchange, where sweet talk could take place between inventors, innovators, engineers, financers, and consumers.

Mokyr compares Islamic civilizations and Christian civilizations in the Middle Ages. He states that:

> the Moslems were enthusiastic collectors, but they offered little in the way of interpretation or theory; unlike the Christian West they were not driven, apparently, 'by a strange urge to peer beneath the surface of things and see how they worked' (Watson, 1983, 94, 146)" (1990, p.40).

The difference in the ideologies of the two societies, in the mindset in which Muslims and Christians viewed new technology and discussed it with each other, affected how much advancement could be derived from it. Islamic societies were good at applying the ideas borrowed from other civilizations, but seldom invented new technologies, and "Islamic society eventually ran out of steam" (Mokyr, 1990, p. 44). The society in which the new technology is presented matters more than what the technology itself is, as even the most revolutionary advancements will not take hold unless the people are persuaded to accept it (1990, p.138).

This means that governments cannot advance their countries' productivity without the support of constituents who are eager to adapt to change and "accept the novelty" of new technologies. Ancient Greek and Roman governments invested large percentages of revenue into the construction of war machines. This promotion of technological advancement allowed for the recognition of the importance of essential elements of machines, such as "the lever, the wedge and the screw, as well as the elements of motion transmission, such as the ratchet, the pulley, the

gear, and the cam" (Mokyr, 1990, p.21). These important elements are the foundations of the technologies that we use today and demonstrated major breakthroughs. Except, these martial advancements didn't advance society, but merely strengthened the capacity of elites to extract rents.

Mokyr states that "these insights were applied mostly to war machines and clever gadgets that were admired for their own sake but rarely put to useful purposes" (1990, p. 22). The Greek state sponsored inventors such as Hero and Ctesibius of Alexandria. Hero engineered temple doors that opened by a steam engine and a coin-operated holy water vending machine. Ctesibius invented a force pump, a water clock, and metal springs. These inventions "served at best recreational purposes" and had "no direct economic purpose" nor did they impact the economy (1990, p.22). A civilian in Greece did not witness any of these inventions and adapt them for his own use to improve his productivity. While the inventors were incentivized through state funding, civilians had no incentive to apply them to production.

The Roman state's "political leaders acquired popularity and political power by carrying out successful public works" (Mokyr, 1990, p. 20). Rome's infrastructure, highly subsidized by the government, included paved streets, sewage systems, and water supplies via aqueducts that supported public bathhouses. Investments in public works purchased legitimacy and gave the Roman Empire vast amounts of credit throughout history.

However, Mokyr argues that this hype is undue. The systems were "highly developed," but they were more impressive due to their scale and scope, rather than evidence of a creative society. Without active market engagement, the most efficient methods of enacting these works were neglected, as the state's goal was to bring the projects to fruition so that the constituents would be satiated, not that expenses were minimized or that the projects closely met the needs of

consumers. Moykr gives Rome credit for the invention of concrete masonry, but other public works projects were just expansions of Hellenistic inventions (1990, p. 20). Even the religion of Rome, the dominant rhetoric, was copied from the Greeks, as it was an effective tool for legitimization of the government.

Furthermore, the praise of Roman roads, Mokyr claims, "should not be exaggerated" as the roads' economic and cultural significance has been much overstated by historians and the media. These roads were constructed for "military purposes and their use by the general public for the purpose of trade was incidental." The only roads that lasted past the Roman Empire's demise were those that were used infrequently (1990, p. 21). Archeologist M.C. Bishop argues that "the Roman roads of Hollywood films with neatly paved surfaces are a standard visual cliché… such roads were not common in the provinces" due to the available materials or labor hours required (Bishop, 2014). The Roman roads in Britain lacked long-term durability, which would have been vital if the intended purpose of the road construction was to encourage trade. Bishop states that the roads constructed in Britain were for "military construction and exploitation" and that expansions on the military roads were completed and funded by British town councils who taxed their constituents, not Rome or its citizens (Bishop, 2014).

The Roman government sponsored many public works projects, but these offerings did not promote a society that valued invention and innovation. If anything, the handouts stifled private incentives. North states that Rome "was feeding 120,000 of its citizens free" off of the ever-increasing taxes that were burdened by the lowest classes in Roman society, those that "had little access to political favoritism" (North, 1981, p. 122).

Roman constituents lacked incentives to innovate, and there was little advancement in inventions, as:

> when classical civilization succeeded in creating a novel technique it was often unable or unwilling to take it to its logical conclusion and to extract anything approximating the maximum economic benefit from it. Many inventions that could have led to major economic changes were undeveloped, forgotten, or lost" (Mokyr, 1990, p. 29).

State investments in infrastructure and technology were not intended to lead to economic progress, and technological advancements did not occur as an external result.

While states can encourage economic growth, they cannot create it from nothing. Economist Friedrich Hayek (1945) attributes this deficiency to the knowledge problem, wherein:

> "knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all separate individuals possesses" and that a "single mind" could "never be so given" (Hayek, 1945, p. 519).

Hayek explains that knowledge about factors in the economy is dispersed throughout the population, and those that specialize in a trade or position are able to gather information that is relevant to them and use the information when "the circumstances of the fleeting moment" deem it necessary (1945, p. 522). In a decentralized economy, individuals make decisions based on prices. Hayek refers to this price system as a "marvel... not the product of human design" that people do not realize that they follow. Price makes up for lack of information as it "coordinate[s] the separate actions of different people" (1945, p. 526, 527).

Centralized governments have difficulty making efficient decisions as the state is not an expert in every market or field. The state is also not subject to prices as the state can use force to coerce the exchange of goods, and without prices, an active market is incapable of efficient economic calculation. To attempt to make efficient decisions, the knowledge would have to be

gathered from the public and "given to [a] planner" (Hayek, 1945, p. 520). If the Roman government were to build efficient roads for the purpose of developing trade and growing the economy, the state would need to ascertain the best materials for the terrain, the best route for the roads, the most efficient way to lay the roads, etc. But to know the best option is to have good information about the opportunity costs of alternatives, and calculation of costs requires prices. All of this information would need to be communicated to the panel in charge.

The Roman government did not, however, build the roads for the advancement of the economy or to stimulate markets with trade, but to enforce the state's legitimacy through the power of the Roman army, which was enabled to move quicker with the placement of dependable roads. The public works projects were tools to maintain legitimacy as well, as a placated public would be less likely to rebel from the Roman state's influence. The state knew when to fund a new project or subsidize more perks for citizens when the respect of the government was being questioned. Where decentralized markets can depend on the price system to make efficient choices, centralized governments are much slower to respond. The difference between the inventions of ancient Rome and those of eighteenth-century Western Europe was who was doing the inventing and the drives that motivated them.

While Hero and Ctesibius were incentivized to invent and tinker, many individuals did not have this privilege. Mokyr states that, in classical antiquity, "the number of engineers and inventors was small and they often tried to keep their inventions secret, taking their ideas with them to the grave" (Mokyr, 1990, p. 29). Society was not open to the idea of inventors, and any inventions that could be conceptualized would have been unwelcome to the market.

During the Renaissance, this continued to be the case, as "the handicaps and obstacles that new technology faced during this period" were brought about by the "extent [to which]

society tolerates deviation and nonconformism" (Mokyr, 1990, p.75-76). Religious movements in Christianity, including the Reformation and the Counter-Reformation, created a negative environment for inventors who were going against the grain of their communities. Mokyr states that the church-state in Europe became "a more bigoted place than it had been since the Crusades" and that "the authorities' patience for people who thought for themselves and were critical of dogma was wearing thin" (1990, p. 76).

Not only were religious institutions set against change, states themselves often discouraged technological innovations in order to appease guilds, which were made up of powerful "manufacturers as well as merchants" (North, 1981, p. 133). Mokyr reasons that "there are many documented cases of the authorities trying to suppress innovations in established industries, doubtlessly instigated by lobbies of vested interests" and monopolies that were held by the guilds (Mokyr, 1990, p. 77). Unfortunately for guilds and religious institutions that survived on placated constituents and protection from states, constituents in Western Europe were beginning to place their faith in different foundations.

A change in communal beliefs allowed for the acceptance and encouragement of advancing technologies. Mokyr states that "the very essence of technological change is such that some mental change had to occur first" (1990, p. 202). Boiling all cultures and civilizations into just one explanation for the aversion to technological change before the Industrial Revolution would be impossible and inaccurate, as the ideologies of each culture were shaped by many different factors. Mokyr illustrates two main concepts for the slow accruement of technological advancements: the mindset in which individuals viewed their place in society and their place in nature. The strength of these forces varied in each individual civilization.

Classes in society develop through exertion of power, and peculiarities in rhetoric. The grouping of individuals due to labor types, incomes, and lineages can be seen in most societies, though in some civilizations the lines are blurred and easier to cross. In the pre-Industrial Revolution world (and since this period, as the effects of class structures are still prevalent in today's societies), however, these distinctions often came with negative connotations towards labor and those that performed it, further separating classes from each other. Mokyr claims that the class structure limited individuals not only in their actions, but also in how they thought, asserting that "an ascriptive hierarchy in which economic and social status were inherited rather than achieved would naturally inhibit technical progress" (1990, p. 196).

For Mokyr, this argument is based on the concept that those who were performing labor, such as working the fields or creating textiles, would be the ones who knew the mechanics of the labor that they were performing. Individuals with the technical and local knowledge necessary to invent improved methods for production had neither the class prestige to press for these improvements nor the education to expand upon their concepts, and might not have had the incentive to do so anyway, if their gains could be easily taxed away. Even those who were educated in math and engineering weren't often incentivized to make real change.

Mokyr contends that the Roman influence on western Europe, even after the fall of the empire, prioritized "distinctly noneconomic achievements: military, intellectual, administrative, and artistic knowledge were appreciated more than production" (1990, p.199). The expansion of technical knowledge was driven by academics, who did not utilize what they learned to develop new technologies or increase productivity or promote efficiency. Mokyr describes this as a "chasm between the educated and literate classes on the one hand, and the working portions of

the population on the other," and this divide, increased by differences in rhetoric, separated skill from technical knowledge.

The other factor that contended with technological advancement was the position that man saw himself filling in nature. Religions played a large role in this. If nature was considered to be above man; "if every stream, every tree, every patch of land is populated by spirits, the environment remains capricious, unpredictable, and uncontrollable" and "tinkering with [nature's] rules was dangerous and sinful" (Mokyr, 1990, p. 200). This discouragement was powerful enough among uneducated classes. The rise of Christianity altered man's role in nature from a powerless pawn at the whim of nature and gods to the natural caretaker of the world through the rhetoric displayed in the Bible, and this subverted the power structure. Mokyr writes that:

> "if nature is perceived as a hostile and jealous adversary, or if the payoff that really matters is the salvation of the soul, then there seems little point in playing the game at all. But if the universe is subject to logical, mechanical forces that can be controlled and manipulated in ways that do not involve committing a sin, and if it becomes clear that the payoff is a standard of living above the very minimum of subsistence, the first condition necessary for the beginning of technological progress is fulfilled." (1990, p. 202)

If man is no longer too weak to control nature, if man is understood as participating with God in an ongoing creative work, the limitations of society are weak as well.

This shift in beliefs did not happen all at once, but very slowly, over hundreds of years. The strength of guilds and states weakened over time, as did the effectiveness of investments in legitimacy made by states. McCloskey portrays the situation in this way:

> "In northwestern Europe the strange idea rose up that aristocracy (the rule of the best by descent) and theocracy (the rule of priests) and even plutocracy (the rule of the present rich) were all nasty. What replaced them in people's ideology, slowly, was the rule of the better technique, allowing free entry to compete with the monopolies that the aristocrats or the plutocrats had arranged under the aegis of a captured government. The new ideology in places like Britain and Belgium around 1800 favored a "betterocracy," …[where] the profits [should go] to the betterers" (McCloskey, 2016, p. 22).

The "betterers" in this excerpt are the bourgeois inventors and business-owners, whose "better techniques" allowed them to make profits from entering markets that earlier inventors had been dissuaded from entering by to guilds and elite institutions. The advantages of the bourgeois were due to a supportive society as well as the marketing techniques that the inventors used, including knowledge of their target market, the creation of products that fit consumer needs, and the rhetoric that was utilized.

The field of marketing is relatively new, only becoming a distinct discipline in the early 1900s. Notre Dame marketing professors, William L. Wilkie and Elizabeth S. Moore (2003), detail the history of marketing as a discipline in "Scholarly Research in Marketing: Exploring the '4 Eras of Thought Development.'" Wilkie and Moore state that the period they label as "Pre-Marketing" encapsulates "marketing related phenomena [that] was available prior to the formal beginnings of the field of study" (Wilkie & Moore, 2003, p. 116). This information was recorded and detailed by:

> the great economists of the 1700s and 1800s (including Smith, Malthus, Jevons, Ricardo, Mill, and Marshall) [who studied] the concepts of markets, marginal analysis, value, production, humans as social and economic entities, competition, and the role of

> governments… at of the turn of the twentieth century, therefore, the area that would become "marketing" was firmly ensconced within the field of economics (Wilkie & Moore, 2003, p. 116).

Marketing spawned off of the field of economics as economists became free to express their ideas in a society under the waning influence of state and religion.

Mokyr states that in Britain, the "government was one of, by, and for property owners" (Mokyr, 1990, p. 246). Further, "inventions and improvements became, in some circles at least, respectable" after inventors began to accumulate wealth and fame (1990, p. 255). States in the West became formatted to support and encourage inventors as inventions helped make society better off and the constituents, who benefited from the new products diffusing through the market, promoted the occurrence of this change.

This had not always been the case with inventions. As stated earlier, the slow diffusion rate of new products was very common before the Industrial Revolution. Products that did not enter the consumer market did not have the opportunity to affect the economy. One of the greatest examples of this is the clock. In the first millennium, China invented its first water clock. Su Sung, a Chinese scientist and statesman, created a clock that was "40 ft. high, and display[ed] not only the time but also an impressive array of astronomical variables" (Mokyr, 1990, p. 214-215). This clock, however, was not commercialized so that it could be replicated and sold to citizens. Instead, Su Sung's hydraulic clock was "built by and for government officials at the emperor's instructions," and even the time that the clock displayed was under the sovereignty of the emperor, who "monopolze[d] the measurement of time and the calendar" (Mokyr, 1990, p. 233). Like with the Greek inventors Hero and Ctesibius, Su Sung invented for

the state, not for himself, and any economic benefit that arose from his work was filtered through the motives of his government, and captured as rents by the elite.

In contrast, the weight-driven mechanical clock, invented in the 13th century Europe, had an enormous effect on the economy and on society. Europeans and Arabs had "been able to build sophisticated water clocks," but Mokyr explains that water clocks were unreliable, as water is liable to freeze and evaporate (1990, p. 49). The invention of the weight-driven mechanical clock spurred competition as well as diffusion through the European market. Mokyr delineates that:

> by the middle of the fourteenth century clockmakers such as the Dondi family and Richard of Wallingford were making complex devices that indicated not just the time, but also every astronomical motion then known. Clocks spread rapidly throughout Europe. Landes (1983, p. 57) points to a "clear sense of excitement and pride" in the new mechanisms. Every town felt that it had to possess this marvel…. In the middle of the fifteenth century spring-driven clocks and watches appeared… and watches became a popular consumer good among the better-off" (Mokyr, 1990, p. 49-50).

In the European market, clocks were valued by individuals as well as states, and this interest incentivized clock-makers to discover ways to make clocks more accessible to their markets. In the beginning of this diffusion process, entire towns were needed to raise the funds for a shared clock, but in the turn of one century, individuals were able to purchase clocks small enough to be held in a hand, and durable enough to be a part of a person's daily wardrobe, pocket-watches.

The mechanical clock demonstrated the value in a respectable consumer market, and as French clock-makers fled to Britain after "'a wave of anti-Protestant bigotry' (Landes, 1983, p. 219)," Britain built its mechanical industry on the "mechanical skills of clock-makers" which acted as a "cornerstone" (Mokyr, 1990, p. 241). The commercial success of clocks pushed for

further developments in the mechanical field as other inventors hoped to find gains. However, if inventors did not know the needs and wants of their consumers, any efforts towards discovering a new product would be a blind pursuit founded on luck.

Bourgeois inventors' and innovators' abilities to impact markets was attributable to the knowledge that they were able to gather and utilize. This relates back to Hayek's distribution of knowledge theory. Economist Israel Kirzner (1997) argues that knowledge can be enhanced through market interaction, and that markets reach:

> equilibrium [through] a systematic process in which market participants acquire more and more accurate and complete mutual knowledge of potential demand and supply attitudes… [through] entrepreneurial discovery (Kirzner, 1997, p. 62).

As more products reach the market, consumers are able to make more choices based on their needs and preferences. This results in more information being available to entrepreneurs to capitalize on. Economist and professor Steven Horwitz states that:

> in the market, experience, context, and skill can lead individuals to know things about their environment and about how to react to it—knowledge that cannot be communicated except through the choices they make in the marketplace (Horwitz, 2009, p. 518-519).

The marketplace is both the display of current knowledge and the tool with which more knowledge can be gathered.

The driving force of competition also incentivizes entrepreneurs to try and meet consumer needs as closely as possible in order to maintain or grow their market share and to continue to gain profits. Kirzner states that competition "manifests itself in the facts that the sellers must outdo one another by offering better or cheaper goods and services" (1997, p. 68). Innovations and inventions give entrepreneurs an edge over their competition or open up

completely new markets, allowing for the reach of more consumers and more profits. Good marketing requires knowledge being used opportunely.

During the Industrial Revolution in Britain, this drive to combine skill with market knowledge resulted in "British scientists and engineers work[ing] together with commercially minded persons, who were more interested in money than in matters political or military" (Mokyr, 1990, p. 242). The Roman ideals that separated science from skill were weakened as the incentives for profit were introduced. McCloskey states that "on the supply side, the creativity of ordinary people now able to become extraordinary was released" as the lower and middle classes were no longer stuck within their castes and had the opportunity to bring forth ideas and gain rewards. This not only benefitted inventors and innovators or those who were business-savvy, but also benefited consumers, as "on the demand side, the tastes of ordinary people were indulged in cheap watches and Model T Fords and no-press shirts" (McCloskey, 2016, p. 40). The open dialogue between consumers and producers allowed for a wave of consumerism, where consumers were catered to, and those who catered the best were rewarded. The father of economics, Adam Smith (1904), argued that "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest" (Smith, 1904). The entrepreneurial, innovative, inventive bourgeois were individuals who, by acting in their own interests, produced betterments as a result.

This view has the potential to be contentious because people acting in their own interests have the power to overlook and trample on the interests of others. In the time periods before the Industrial Revolution this was often the case, where stationary bandits and elites took advantage of others, deemed them the lower class, and kept them there to toil on behalf of their betters. During the Industrial Revolution, the low wages in factories, the rising rates of pollution, and the

dismal living conditions in cities stand out as negatives in a time when economic progress was taking great strides. In the short run, these actions may lead to financial profits for the unethical businesses perpetrating them.

In the long run, however, ethical policies and actions act to boost the legitimacy of businesses and brands, acquiring the favor of consumers, just as public works projects have boosted the legitimacy of governments. McCloskey argues that:

> Trade-betterment since 1800 came in part, of course, from prudence and profit, which would indeed, without other virtues in attendance, constitute… 'greed'…. But the betterment came also from other virtues – hope, justice, courage, love, faith, and temperance – and raised the prestige of commercial versions of these too. [Modern day] corporations such as Merck, UPS, Walt Disney, and Lockheed-Martin had by early 2014, out of a sense of commercial justice and not merely out of instrumental calculation, stopped giving money to the then-homophobic Boy Scouts of America (McCloskey, 2016, p. xxi).

In the same vein, Horwitz detailed Walmart's swift efforts in the aftermath of Hurricane Katrina, as the superstore provided "a large amount of free merchandise, including prescription drugs, to those in the worst-hit areas… almost immediately after the storm had passed" (2009, p. 514). Walmart was motivated to do this, in part, for the "long-term payoff" in reputation. By becoming a trusted brand, stores like Walmart can gain customers' loyalty. Home Depot, which also donated supplies and labor after the 2005 hurricane, expounded on this, with an executive stating that "I can't think of a quicker way to lose customers than price-gouging" (2009, p. 522). While these are modern examples, they demonstrate ethical decisions that payoff in the long run for

businesses, rather than short-term. The purchasing of legitimacy and reputation, when done ethically, can bring both companies profit as well as benefits for consumers.

The world before the Industrial Revolution saw little change. Under states, powerful religious institutions, and guilds, the incentives for an individual to better his life were dampened by restrictions, both socially and politically. Only during the Dark Ages did this begin to alter, as the institutions that controlled beliefs lost their hold. Inventions and innovations came to the marketplace, and both the suppliers and the consumers of these goods and services benefited from this exchange. When the bourgeois tailored their offerings towards their consumers, and competed against rivals for efficiency and productivity increases, the outcome was the Industrial Revolution. Although Bob Dylan wasn't writing about this time period in his 1964 song, the lyrics "your sons and your daughters/are beyond your command/your old road is rapidly agin'" can be applied to the social shift in beliefs that permitted the Industrial Revolution to take place (Dylan, 1964). Within the span of a few generations, life was irrevocably different, and the betterment that society has garnered as a result can be witnessed in the lives of individuals who have the power to make their own paths.

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